STIC Search Report
EIC 3700

USPTO

STIC Database Tracking Number: 139341

TO: Charles Marmor
Location: RND 7a29
Art Unit: 3736

Case Serial Number: 10/069559

From: Jeanne Horrigan
Location: RND 8A34
Phone: 571-272-3529

jeanne.horrigan@uspto.gov

Search Notes

Attached are the search results for the EMG control of a limb prosthesis.

I tagged the items that seemed most relevant to me, however, I recommend that you review ALL of the results. I did NOT tag the articles by the inventor because ALL of them looked somewhat relevant to me and they all had good dates.

Also attached is a search feedback form. Completion of the form is voluntary. Your completing this form would help us improve our search services.

I hope the attached information is useful. Please feel free to contact me if you have any questions or need additional searching on this application.

JH

sira
Search and Information Resources Administration

Access DB# 139341

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Charles Marmor, II Examiner #: 74438 Date: 12/2/04
Art Unit: 3736 Phone Number 202-4730 Serial Number: 10/069,559
Mail Box and Bldg/Room Location: RAN 7A29 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: EMG Control of Prosthesis

Inventors (please provide full names): Ronald Raymond Riso

Earliest Priority Filing Date: 8/20/1999

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

Methods of Controlling a prosthesis using a plurality of sets of dedicated electrodes or transducers that are implanted subcutaneously, epimesially or intramuscularly to detect electromyographic (EMG) or myoelectric signals from various muscles which are used to control a prosthetic device such as an arm or hand.

****

STAFF USE ONLY	**Type of Search**	**Vendors and cost where applicable**
Searcher: Jeanne Horrigan	NA Sequence (#) ____	STN ____
Searcher Phone #: 2-3527	AA Sequence (#) ____	Dialog ____
Searcher Location: RND 8A34	Structure (#) ____	Questel/Orbit ____
Date Searcher Picked Up: ____	Bibliographic ____	Dr.Link ____
Date Completed: ____	Litigation ____	Lexis/Nexis ____
Searcher Prep & Review Time: ____	Fulltext ____	Sequence Systems ____
Clerical Prep Time: ____	Patent Family ____	WWW/Internet ____
Online Time: ____	Other ____	Other (specify) ____

PTO-1590 (8-01)

DIALOG(R)File 2:INSPEC

00200239 INSPEC Abstract Number: B70039092

Title: Technical aspects of the magnetic transcutaneous coupling of EMG signals

Author(s): Becker, W.; Sorel, F.L.J.; Schlittenhardt, P.; Wehner, E.; Engelhardt, A.
Author Affiliation: European Atomic Energy Res. Center, Ispra, Italy
Journal: IEEE Transactions on Magnetics vol.Mag6, no.2 p.334-7
Publication Date: June 1970 Country of Publication: USA
CODEN: IEMGAQ ISSN: 0018-9464
Conference Title: Symposium on application of magnetism in bioengineering
Conference Sponsor: Weizmann Inst. Sci.; IEEE, Magnetic and Biomedical engng. groups Israel Soc., Biomedical engng; silver Inst
Conference Date: 9-10 Dec. 1969 Conference Location: Rehovot, Israel
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Abstract: For a long time application of **myoelectric** signal readout (e.g., for patients with controllable **limb** prothesis), a method which avoids the disadvantages of either skin surface **electrodes** or percutaneous galvanic conductors is described. The **electrodes** are placed directly at or inside the **muscle** which generates the wanted signals and are connected by means of two ductile wires to the coil fixed **subcutaneous**ly. Achieved advantages are good separation of signals originating from different **muscles**, improvement in the delivery of signals for a proportional control (to **muscle** activity) of, e.g. **artificial limbs**, and high probability of a good long time reliability because of the technical simplicity.
Subfile: A B

Title: MICROELECTRONIC TELEMETRY IMPLANT FOR MYO-ELECTRIC CONTROL OF A POWERED PROSTHESIS .

Author: Tucker, F. R.; Peteleski, N.
Corporate Source: Health Sci Cent, Winnipeg, Manit
Source: Canadian Electrical Engineering Journal v 2 n 4 Oct 1977 p 3-7
Publication Year: 1977
CODEN: CEEJDY ISSN: 0700-9216
Language: ENGLISH
Journal Announcement: 7807
Abstract: The routine **myoelectric** control systems use **electrodes** on the surface of the skin to pick up the electromyographic signals (**EMG**) from skeletal **muscles**. However, they are inconvenient to the user and susceptible to electrical interference. To avoid all the disadvantages of surface **electrodes** mentioned above, it is necessary to use an **implanted** transmitter which will broadcast the **EMG** for control of the external **prosthesis**. 27 refs.

DIALOG(R)File 2:INSPEC

00200239 INSPEC Abstract Number: B70039092

Title: Technical aspects of the magnetic transcutaneous coupling of EMG signals

Author(s): Becker, W.; Sorel, F.L.J.; Schlittenhardt, P.; Wehner, E.; Engelhardt, A.
Author Affiliation: European Atomic Energy Res. Center, Ispra, Italy
Journal: IEEE Transactions on Magnetics vol.Mag6, no.2 p.334-7
Publication Date: June 1970 Country of Publication: USA
CODEN: IEMGAQ ISSN: 0018-9464
Conference Title: Symposium on application of magnetism in bioengineering
Conference Sponsor: Weizmann Inst. Sci.; IEEE, Magnetic and Biomedical engng. groups Israel Soc., Biomedical engng; silver Inst
Conference Date: 9-10 Dec. 1969 Conference Location: Rehovot, Israel
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Abstract: For a long time application of **myoelectric** signal readout (e.g., for patients with controllable **limb** prothesis), a method which avoids the disadvantages of either skin surface **electrodes** or percutaneous galvanic conductors is described. The **electrodes** are placed directly at or inside the **muscle** which generates the wanted signals and are connected by means of two ductile wires to the coil fixed **subcutaneous**ly. Achieved advantages are good separation of signals originating from different **muscles**, improvement in the delivery of signals for a proportional control (to **muscle** activity) of, e.g. **artificial limbs**, and high probability of a good long time reliability because of the technical simplicity.
Subfile: A B

Title: MICROELECTRONIC TELEMETRY IMPLANT FOR MYO-ELECTRIC CONTROL OF A POWERED PROSTHESIS .

Author: Tucker, F. R.; Peteleski, N.
Corporate Source: Health Sci Cent, Winnipeg, Manit
Source: Canadian Electrical Engineering Journal v 2 n 4 Oct 1977 p 3-7
Publication Year: 1977
CODEN: CEEJDY ISSN: 0700-9216
Language: ENGLISH
Journal Announcement: 7807
Abstract: The routine **myoelectric** control systems use **electrodes** on the surface of the skin to pick up the electromyographic signals (**EMG**) from skeletal **muscles**. However, they are inconvenient to the user and susceptible to electrical interference. To avoid all the disadvantages of surface **electrodes** mentioned above, it is necessary to use an **implant**ed transmitter which will broadcast the **EMG** for control of the external **prosthe**sis. 27 refs.

ASRC Searcher: Jeanne Horrigan
Serial 10/069559
December 6, 2004

```
File 155:MEDLINE(R) 1951-2004/Nov W4
File   5:Biosis Previews(R) 1969-2004/Nov W3
File  73:EMBASE 1974-2004/Nov W4
File  34:SciSearch(R) Cited Ref Sci 1990-2004/Nov W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File 144:Pascal 1973-2004/Nov W4
Set     Items   Description
S1         51   AU='RISO R' OR AU='RISO R.'
S2         52   AU='RISO R R' OR AU='RISO R RICHARD' OR AU='RISO R.R.' OR -
             AU='RISO RON':AU='RISO RR'
S3         25   RD (unique items)
S4         25   Sort S3/ALL/PY,A
```

4/7/5 (Item 5 from file: 434)
DIALOG(R)File 434:SciSearch(R) Cited Ref Sci

04624347 Genuine Article#: PA018 Number of References: 0
Title: COMPARISON OF SUBDERMAL VERSUS SURFACE ELECTROCUTANEOUS STIMULATION
Author(s): RISO RR ; SZETO AYJ; KEITH MW
Corporate Source: CASE WESTERN RESERVE UNIV,CTR REHABIL ENGN,DEPTBIOMED ENGN/CLEVELAND//OH/44106; CASE WESTERN RESERVE UNIV,DEPT ORTHOPAED/CLEVELAND//OH/44106; LOUISIANA TECH UNIV,DEPT BIOMED ENGN/RUSTON//LA/71272
Journal: IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING, 1982, V29, N8, P606
Language: ENGLISH Document Type: MEETING ABSTRACT

4/7/9 (Item 9 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08884759 PMID: 2026429
Cognitive feedback for use with FES upper extremity neuroprostheses.
Riso R R ; Ignagni A R; Keith M W
Department of Biomedical Engineering, Case Western Reserve University, Cleveland, OH 44109.
IEEE transactions on bio-medical engineering (UNITED STATES) Jan 1991, 38 (1) p29-38, ISSN 0018-9294 Journal Code: 0012737
Contract/Grant No.: NO-1-NS-6-2302; NS; NINDS
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed

This paper describes the development of two sensory substitutions systems that provide cognitive feedback for FES hand grasp restoration neuroprostheses. One system uses an array of five electrodes to provide machine status information and a spatially encoded representation of the command signal that a quadriplegic individual generates to achieve proportional grasp control. Only one electrode site is active at any given instant, and a second informational channel is superimposed on the spatial position channel by modulating the frequency of the stimulus pulses. The frequency modulated feedback channel signals six levels of force developed at the finger tips during prehension activities. The second sensory system is an integral part of an implanted FES system and utilizes a single subdermally placed electrode to display machine status information and a five-level frequency code for feedback of the user generated grasp control signal. The multielectrode feedback system was implemented for laboratory

studies using surface mounted electrodes, although its design will ultimately incorporate subdermal electrodes to provide a highly cosmetic and unencumbering system. An evaluation of the effectiveness of grasp force and command signal feedback provided by this multielectrode system in assisting an FES hand system user to regulate grasp force during a laboratory task, showed increased consistency of performance and an economy of grasp effort between 25 and 30%. Alternative strategies for feedback information and coding algorithms are discussed.
Record Date Created: 19910610
Record Date Completed: 19910610

4/7/14 (Item 14 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

0011137541 BIOSIS NO.: 199799771601
Multichannel intraneural electrical stimulation for prosthetic sensory feedback
AUTHOR: Dilorenzo Daniel J (Reprint); Edell David J (Reprint); Riso Ron R ; Koris Mark J; Larson Bruce C (Reprint); Devaney Lisa P (Reprint
AUTHOR ADDRESS: Harvard-MIT Div. Health Sci. Technol., Cambridge, MA 02139, USA**USA
JOURNAL: Society for Neuroscience Abstracts 23 (1-2): p1004 1997 1997
CONFERENCE/MEETING: 27th Annual Meeting of the Society for Neuroscience, Part 1 New Orleans, Louisiana, USA October 25-30, 1997; 19971025
ISSN: 0190-5295
DOCUMENT TYPE: Meeting; Meeting Abstract; Meeting Poster
RECORD TYPE: Citation
LANGUAGE: English

4/7/17 (Item 17 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

10558879 PMID: 10665673
Strategies for providing upper extremity amputees with tactile and hand position feedback--moving closer to the bionic arm.
Riso R R
University of Aalborg, Center for Sensory-Motor Interaction, Denmark. rr@miba.auc.dk
Technology and health care - official journal of the European Society for Engineering and Medicine (NETHERLANDS) 1999, 7 (6) p401-9, ISSN 0928-7329 Journal Code: 9314590
Document type: Journal Article; Review; Review, Tutorial
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
A continuing challenge for prostheses developers is to replace the sensory function of the hand. This includes tactile sensitivity such as finger contact, grip force, object slippage, surface texture and temperature, as well as proprioceptive sense. One approach is sensory substitution whereby an intact sensory system such as vision, hearing or cutaneous sensation elsewhere on the body is used as an input channel for information related to the prosthesis. A second technique involves using electrical stimulation to deliver sensor derived information directly to the peripheral afferent nerves within the residual limb. Stimulation of the relevant afferent nerves can ultimately come closest to restoring the

original sensory perceptions of the hand, and to this end, researchers have already demonstrated some degree of functionality of the transected sensory nerves in studies with amputee subjects. This paper provides an overview of different types of nerve interface components and the advantages and disadvantages of employing each of them in sensory feedback systems. Issues of sensory perception, neurophysiology and anatomy relevant to hand sensation and function are discussed with respect to the selection of the different types of nerve interfaces. The goal of this paper is to outline what can be accomplished for implementing sensation into artificial arms in the near term by applying what is present or presently attainable technology. (26 Refs.)

Record Date Created: 20000302
Record Date Completed: 20000302

```
File 135:NewsRx Weekly Reports 1995-2004/Nov W4
File 481:DELPHES Eur Bus 95-2004/Nov W3
File 624:McGraw-Hill Publications 1985-2004/Dec 06
File 635:Business Dateline(R) 1985-2004/Dec 04
Set     Items   Description
S1        427   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2       4581   ELECTRODES OR TRANSMITTERS
S3      28024   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4      13670   ARTIFICIAL
S5       2225   PROSTHES?S OR PROSTHETIC?
S6     635124   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7      25347   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S8        171   S2(S)S3
S9        508   S4(1W)S6 OR S5(3N)S6
S10         2   S8(S)S9 [too recent]
S11         1   S1(S)S8(S)S6(S)S7
S12         1   S11 NOT S10 [too recent]
S13         1   S1(S)S8(S)S6
S14         0   S13 NOT S12

File 155:MEDLINE(R) 1951-2004/Nov W4
File   5:Biosis Previews(R) 1969-2004/Nov W3
File  73:EMBASE 1974-2004/Nov W4
File  34:SciSearch(R) Cited Ref Sci 1990-2004/Nov W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File 144:Pascal 1973-2004/Nov W4
File   2:INSPEC 1969-2004/Nov W4
File   6:NTIS 1964-2004/Nov W4
File   8:Ei Compendex(R) 1970-2004/Nov W4
File  35:Dissertation Abs Online 1861-2004/Nov
File  65:Inside Conferences 1993-2004/Dec W1
File  94:JICST-EPlus 1985-2004/Oct W5
File  95:TEME-Technology & Management 1989-2004/Jun W1
File  99:Wilson Appl. Sci & Tech Abs 1983-2004/Oct
Set     Items   Description
S1     203595   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2     411193   PROSTHES?S OR PROSTHETIC? OR ARTIFICIAL()(ARM OR ARMS OR H-
             AND OR HANDS OR LEG OR LEGS OR FOOT OR FEET OR LIMB? ?)
S3    1470864   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4     568504   ELECTRODES OR TRANSMITTERS
S5    2814641   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S6          0   S S3(S)S4
S7      39811   S3(S)S4
S8         68   S1 AND S2 AND S7 AND S5
S9         40   RD (unique items)
S10        15   S9/2000:2004
S11        25   S9 NOT S10
S12        25   Sort S11/ALL/PY,A
S13   2411042   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR EXTREMITY OR EXTREMITIES
```

```
S14    408844   PROSTHES?S OR PROSTHETIC?
S15   1063290   ARTIFICIAL
S16     14415   S15(1W)S13 OR S14(2N)S13
S17      1412   S1 AND S16
S18        16   S7 AND S17
S19         4   S18 NOT S8
```

12/6/3 (Item 3 from file: 73)
00343156 EMBASE No: 1975115518
Theory and design of capacitor electrodes for chronic stimulation
1974

12/6/8 (Item 8 from file: 8)
02102471
Title: ELECTROMYOGRAPHY **AND ACCELERATION OF THE TRUNK AS TRIGGER SOURCES FOR IMPLANTABLE GAIT STIMULATION.**
Conference Title: Proceedings of the Eighth Annual Conference on Rehabilitation Technology: Technology - A Bridge to Independence.
Publication Year: 1985

12/6/10 (Item 10 from file: 8)
02102421
Title: INPUT-OUTPUT RESPONSE OF THE QUADRICEPS MUSCLE IN PARAPLEGIC PATIENTS.
Conference Title: Proceedings of the Eighth Annual Conference on Rehabilitation Technology: Technology - A Bridge to Independence.
Publication Year: 1985

12/6/11 (Item 11 from file: 2)
02825072 INSPEC Abstract Number: A87028778, B87014941
Title: Prediction and evaluation of ankle movement with implantable peroneal stimulators
Publication Date: 1986

12/6/14 (Item 14 from file: 155)
08607078 PMID: 2377004
Study of the effects of motor unit recruitment and firing statistics on the signal-to-noise ratio of a myoelectric control channel.
May 1990

12/6/15 (Item 15 from file: 155)
08523226 PMID: 2336907
[Electromyographic findings in the gluteal muscles in the Watson-Jones and the Bauer surgical approaches to the hip joint]
Elektromyograficky nalez v glutealnim svalstvu pri Watsonove-Jonesove a Bauerove pristupu ke kycelnimu kloubu.
Feb 1990

12/6/18 (Item 18 from file: 2)
5514245 INSPEC Abstract Number: A9707-8730-011, B9704-7520E-007
Title: The relationship between stimulus parameters and muscle response utilising implantable stimulator
Publication Date: 1996
Copyright 1997, IEE

12/6/19 (Item 19 from file: 95)
01011159 I96070983941
Quantification of recruitment properties of multiple contact cuff electrodes
(Quantifizierung der Messeigenschaften von Mehrfach-Cuff-Elektroden)
1996

12/7/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

00200239 INSPEC Abstract Number: B70039092
Title: Technical aspects of the magnetic transcutaneous coupling of EMG signals
Author(s): Becker, W.; Sorel, F.L.J.; Schlittenhardt, P.; Wehner, E.; Engelhardt, A.
Author Affiliation: European Atomic Energy Res. Center, Ispra, Italy
Journal: IEEE Transactions on Magnetics vol.Mag6, no.2 p.334-7
Publication Date: June 1970 Country of Publication: USA
CODEN: **IEMGAQ** ISSN: 0018-9464
Conference Title: Symposium on application of magnetism in bioengineering
Conference Sponsor: Weizmann Inst. Sci.; IEEE, Magnetic and Biomedical engng. groups Israel Soc., Biomedical engng; silver Inst
Conference Date: 9-10 Dec. 1969 Conference Location: Rehovot, Israel
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Abstract: For a long time application of **myoelectric** signal readout (e.g., for patients with controllable **limb** prothesis), a method which avoids the disadvantages of either skin surface **electrodes** or percutaneous galvanic conductors is described. The **electrodes** are placed directly at or inside the **muscle** which generates the wanted signals and are connected by means of two ductile wires to the coil fixed **subcutaneous**ly. Achieved advantages are good separation of signals originating from different **muscles**, improvement in the delivery of signals for a proportional control (to **muscle** activity) of, e.g. **artificial limb**s, and high probability of a good long time reliability because of the technical simplicity.
Subfile: A B

12/7/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

03758885 PMID: 4786757
[Technical facilities for arm and hand function]
Tekniska hjalpmedel for **arm**- och **hand**funktion.
Lakartidningen (SWEDEN) Aug 1 1973, 70 (31) p2731-9, ISSN 0023-7205
Journal Code: 0027707
Document type: Journal Article
Languages: SWEDISH
Main Citation Owner: NLM
Record type: Completed
Record Date Created: 19740605
Record Date Completed: 19740605

12/7/5 (Item 5 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

00728411 E.I. Monthly No: EI7807052773 E.I. Yearly No: EI78069095

Title: MICROELECTRONIC TELEMETRY IMPLANT FOR MYO-ELECTRIC CONTROL OF A POWERED PROSTHESIS .

Author: Tucker, F. R.; Peteleski, N.
Corporate Source: Health Sci Cent, Winnipeg, Manit
Source: Canadian Electrical Engineering Journal v 2 n 4 Oct 1977 p 3-7
Publication Year: 1977
CODEN: CEEJDY ISSN: 0700-9216
Language: ENGLISH
Journal Announcement: 7807

Abstract: The routine **myoelectric** control systems use **electrodes** on the surface of the skin to pick up the electromyographic signals (**EMG**) from skeletal **muscles**. However, they are inconvenient to the user and susceptible to electrical interference. To avoid all the disadvantages of surface **electrodes** mentioned above, it is necessary to use an **implanted** transmitter which will broadcast the **EMG** for control of the external **prosthesis**. 27 refs.

12/7/6 (Item 6 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

05694892 PMID: 7027837

Implantable electrical and mechanical interfaces with nerve and muscle.

Hoffer J A; Loeb G E
Annals of biomedical engineering (UNITED STATES) 1980 8 (4-6) p351-60, ISSN 0090-6964 Journal Code: 0361512
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
(26 Refs.)
Record Date Created: 19811221
Record Date Completed: 19811221

12/7/7 (Item 7 from file: 2)
DIALOG(R)File 2:INSPEC

02326891 INSPEC Abstract Number: A84093969, B84056188

Title: Bioelectric control of powered prosthesis for amputees

Author(s): Charles, D.; Stein, R.B.
Author Affiliation: Dept. of Physiology, Univ. of Alberta, Edmonton, Alta., Canada
Conference Title: Frontiers of Engineering and Computing in Health Care - 1983. Proceedings of the Fifth Annual Conference p.678
Editor(s): Gerhard, G.C.; Miller, W.T.
Publisher: IEEE, New York, NY, USA
Publication Date: 1983 Country of Publication: USA 735 pp.
Conference Sponsor: IEEE
Conference Date: 10-12 Sept. 1983 Conference Location: Columbus, OH,USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P); Experimental (X)

Abstract: Summary form only given. Forty upper **extremity** human amputees have been fitted with powered electric **prostheses** . Different methods of controlling these **prostheses** are compared and evaluated. The most common method processes **EMG** signals obtained from skin surface **electrodes** over the remaining **muscles** . Processing may include different degrees of

filtering, one or more levels of threshold switching, or various types of proportional control. For amputees at shoulder level for whom satisfactory **muscle** control sites are not available, different methods must be used. Skin conductivity touch control may be used to replace bulky and unreliable mechanical switches. Recent developments in chronic nerve recording using **permanently implantable nerve cuffs** are discussed, together with the development of an FM-telemetry system which may avoid the risks otherwise associated with passing signal leads through the skin on a long-term basis.
Subfile: A B

12/7/9 (Item 9 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02102422 E.I. Monthly No: EIM8607-044743
Title: EXPERIENCE WITH A HELICAL PERCUTANEOUS ELECTRODE IN THE HUMAN LOWER EXTREMITY.
Author: Marsolais, E. B.; Kobetic, Rudi
Corporate Source: Cleveland Veterans Administration Medical Cent, Cleveland, OH, USA
Conference Title: Proceedings of the Eighth Annual Conference on Rehabilitation Technology: Technology - A Bridge to Independence.
Conference Location: Memphis, TN, USA Conference Date: 19850624
Sponsor: Rehabilitation Engineering Soc of North America, Washington, DC, USA
E.I. Conference No.: 07847
Source: Publ by Rehabilitation Engineering Soc of North America, Washington, DC, USA p 243-245
Publication Year: 1985
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8607
Abstract: Helical percutaneous **electrodes** have been **implanted** in major **muscles** of the hip and **leg** of complete paraplegics. Preprogrammed stimulation patterns, delivered by a 32-channel microprocessor controlled stimulator, have allowed standing and functional walking. Analysis of the histories of 702 **electrodes implanted** in six subjects over a period of 29 months showed a probability of failure which decreased exponentially during the first four months, and then continued constant at 2-3%/month thereafter. (Author abstract) 7 refs.

12/7/13 (Item 13 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

02520735 E.I. Monthly No: EIM8801-000630
Title: FUNCTIONAL ACTIVATION OF SKELETAL MUSCLES USING EPIMYSIAL SIMULATION ELECTRODES.
Author: Fang, Zi-Ping; Mortimer, J. Thomas
Corporate Source: Case Western Reserve Univ, Cleveland, OH, USA
Conference Title: Proceedings of the Thirteenth Annual Northeast Bioengineering Conference.
Conference Location: Philadelphia, PA, USA Conference Date: 19870312
Sponsor: Drexel Univ, Philadelphia, PA, USA; IEEE, Engineering in Medicine & Biology Soc, New York, NY, USA; Univ of Pennsylvania, Philadelphia, PA, USA
E.I. Conference No.: 10506

Source: Bioengineering, Proceedings of the Northeast Conference 13th. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (Cat n 87CH2436-4), Piscataway, NJ, USA p 570-573
Publication Year: 1987
CODEN: BENYDB
Language: English
Document Type: PA; (Conference Paper)
Journal Announcement: 8801
Abstract: An **epim**ysial electrode (an electrode **implant**ed on the surface of the **muscle**) has been designed for stimulation applications and tested in chronic animal experiments. The electrode consists of a platinum conducting surface, a silicone rubber insulation package and a helical lead. Fifteen **electrodes** were **implant**ed on the hind **leg muscle**s of five cats. Electrical stimulation was applied 24 hours per day for up to one year. Monthly noninvasive ankle torque measurements showed stable force modulation properties throughout the **implant**ation-stimulation period. All the **electrodes** were intact and no tissue damage was observed on inspection at the end of the long-term experiments. The results indicate that the **epim**ysial electrode can be reliably used in functional neuro**muscular** stimulation systems to restore lost motor functions in paralyzed patients. 8 refs.

12/7/21 (Item 21 from file: 2)
DIALOG(R)File 2:INSPEC

6396218 INSPEC Abstract Number: C1999-12-3385C-010
Title: Adaptation of arm movement control under repeated perturbations
Author(s): Weber, D.J.; Chi, A.; Ji-Ping He
Author Affiliation: Arizona State Univ., Tempe, AZ, USA
Conference Title: Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Vol.20 Biomedical Engineering Towards the Year 2000 and Beyond (Cat. No.98CH36286) Part vol.5 p.2354-7 vol.5
Editor(s): Chang, H.K.; Zhang, Y.T.
Publisher: IEEE, Piscataway, NJ, USA
Publication Date: 1998 Country of Publication: USA 6 vol. xviii+xix+3384 pp.
ISBN: 0 7803 5164 9 Material Identity Number: XX-1999-00307
U.S. Copyright Clearance Center Code: 0 7803 5164 9/98/$10.00
Conference Title: Proceedings of the 20th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Vol.20 Biomedical Engineering Towards the Year 2000 and Beyond
Conference Sponsor: Biomed. Div. Hong Kong Inst. Eng.; Chinese Biomed. Eng. Soc
Conference Date: 29 Oct.-1 Nov. 1998 Conference Location: Hong Kong, China
Language: English Document Type: Conference Paper (PA)
Treatment: Experimental (X)
Abstract: To develop control strategies for a **prosthe**tic **arm** or electrical stimulation of paralyzed **muscles**, we have designed a novel approach to investigate how the neural system utilizes available sensory information to learn and adapt to a perturbation for the intended **arm** reaching movement. A parallel approach of both human and animal experiments allows us to collect data from cortical neurons, **muscles** and **arm** movement kinematics to analyze coordinated changes in control strategy of various

levels in the sensorimotor system. We simultaneously record neural activities in motor cortex, **EMG** responses in 7 **arm muscles**, and **arm** movement trajectories during a visually guided reaching task. Force perturbations (an impulse of 75-100 ms) are delivered through a string attached to the wrist of the moving **arm**. Preliminary results and data analysis demonstrate that human subjects develop an anticipatory strategy to improve performance of reaching tasks under repeated force perturbations applied to the wrist. The same experimental protocol has been modified to rhesus monkeys with **implant**ed multichannel cortical **electrodes**. Data collected from this experiment show that correlation of adaptation among individual and populations of cortical neurons, **muscle** coordination patterns, and kinematics can be established. (10 Refs) Subfile: C

12/7/23 (Item 23 from file: 2)
DIALOG(R)File 2:INSPEC

6483346 INSPEC Abstract Number: A2000-05-8770J-018, B2000-03-7520E-007, C2000-03-3385C-004

Title: Upper limb prosthesis controlled by myoelectric signal

Author(s): Escudero, Z.; Leija, L.; Alvarez, J.; Munoz, R.
Author Affiliation: Centro de Investigacion y de Estudios Avanzados, IPN, Mexico City, Mexico
Conference Title: Proceedings of the First Joint BMES/EMBS Conference. 1999 IEEE Engineering in Medicine and Biology 21st Annual Conference and the 1999 Annual Fall Meeting of the Biomedical Engineering Society (Cat. No.99CH37015) Part vol.1 p.636 vol.1
Publisher: IEEE, Piscataway, NJ, USA
Publication Date: 1999 Country of Publication: USA 2 vol. vi+1345 pp.
ISBN: 0 7803 5674 8 Material Identity Number: XX-1999-03127
U.S. Copyright Clearance Center Code: 0 7803 5674 8/99/$10.00
Conference Title: Proceedings of the First Joint BMES/EMBS Conference
Conference Sponsor: Medtronic; Johnson & Johnson; Baxter Cardio Vascular Group; Becton Dickinson & Co.; Georgia Biomed. Partnership; Guidant Found.; Kilpatrick Stockton LLP; King & Spaulding; Troutman Sanders LLP; Adv. Tissue Sci.; AVL Biosense Corp.; CUH2A; Ernst & Young LLP; State of Georgia ; Dept. Ind.; Trade & Tourism; Healthdyne Companies; Long Aldrige & Norman; Porex Corp.; Sulzer Innotec; Turner Constr. Company
Conference Date: 13-16 Oct. 1999 Conference Location: Atlanta, GA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)

Abstract: The authors propose a design of a **myoelectric prosthesis** with two active and one passive degrees of freedom to fit on a **limb** with an above elbow amputation. It will be controlled by **myoelectric electrodes implanted** directly on the **muscle** surface. (3 Refs)
Subfile: A B C

12/7/25 (Item 25 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01796238 ORDER NO: AADAA-I9932516

PRIMARY MOTOR CORTEX: FUNCTIONAL REORGANIZATION WITH ACQUISITION OF SUBTLY CHANGING MOTOR TASKS, AND SUITABILITY OF MULTI-SITE, MULTI-UNIT CORTICAL RECORDINGS FOR CONTROL OF A PROSTHETIC DEVICE (MAPS, INTRACORTICAL

MICROSTIMULATION)
Author: HOCHBERG, LEIGH ROBERT
Degree: PH.D.
Year: 1999
Corporate Source/Institution: EMORY UNIVERSITY (0665)
Adviser: DONALD R. HUMPHREY
Source: VOLUME 60/06-B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 2541. 232 PAGES

Previous investigations have suggested that MI fore**limb** maps, defined by intracortical microstimulation (ICMS), change when a monkey learns new motor skills. However, some of the observed map changes in these studies may have been "set" related, and not demonstrative of more enduring changes in synaptic efficacy. In the first study reported here, we attempted to circumvent this problem by using chronically **implant**ed micro**electrodes** to determine whether MI maps change during the acquisition of subtle shifts in fore**limb** tasks, and whether map changes persist in the alert animal outside of the training paradigm.

A monkey was first trained to perform a visually-guided step tracking task. **EMG** leads were **implanted** into four fore**arm** **muscles** , and 36 microwire **electrodes** were **implanted** into the contralateral NE **arm-hand** area. Using ICMS, initial **muscle** maps were obtained. These and all subsequent maps were obtained on <italic>non-training days</italic>, while the monkey simply held the manipulandum in a fixed position. The animal was then required to track a pseudo-randomly, continuously moving target, but using the same wrist movements as used previously. After learning this task, new MI maps were collected. The relationship between the direction of wrist and cursor movement was then reversed, and maps were collected during acquisition of this second new task. With acquisition of both new motor tasks, MI maps fractionated and/or changed shape, with a disappearance of evoked responses at the site of initially <italic>lowest</italic> threshold. Spatial correlations between **muscle** maps also changed with task acquisition. These data support the conclusion that motor learning is indeed accompanied, day-to-day, by the persistent functional reorganization of MI.

NU could also provide signals for control of a **prosthesis** by paralyzed persons if stable, discriminable signals could be obtained. Using the same chronically **implant**ed microwire technology, we collected multi-unit MI recordings from a monkey performing wrist and reaching movements. From quantitative (though not spatially localized) differences in activity across the MI **arm/hand** area, neural commands for these different movements could be distinguished reliably. We conclude that summed spikes from neuronal clusters may be useful for the direct, real-time control of a **prosthetic** device.

19/7/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

04310619 PMID: 985948
[Development of powered prosthetic **hands]**
Kato I; Tanaka S
Iyo denshi to seitai kogaku. Japanese journal of medical electronics and biological engineering (JAPAN) Feb 1976, 14 (1) p1-8, ISSN 0021-3292
Journal Code: 17720370R
Document type: Journal Article
Languages: JAPANESE

```
Main Citation Owner: NLM
Record type: Completed
Record Date Created: 19761002
Record Date Completed: 19761002
```

File 149:TGG Health&Wellness DB(SM) 1976-2004/Nov W1
File 441:ESPICOM Pharm&Med DEVICE NEWS 2004/Dec W1
File 16:Gale Group PROMT(R) 1990-2004/Dec 06
File 160:Gale Group PROMT(R) 1972-1989
File 148:Gale Group Trade & Industry DB 1976-2004/Dec 06
File 9:Business & Industry(R) Jul/1994-2004/Dec 03
File 98:General Sci Abs/Full-Text 1984-2004/Sep
File 636:Gale Group Newsletter DB(TM) 1987-2004/Dec 06
File 369:New Scientist 1994-2004/Nov W3
File 370:Science 1996-1999/Jul W3
File 20:Dialog Global Reporter 1997-2004/Dec 06

Set	Items	Description
S1	9197	**ELECTROMYOGRA?** OR **MYOELECTRIC**? OR **EMG**
S2	35479	**PROSTHES**?S OR **PROSTHETIC**? OR **ARTIFICIAL**()(**ARM** OR **ARMS** OR H-AND OR **HANDS** OR **LEG** OR **LEGS** OR **FOOT** OR **FEET** OR **LIMB**? ?)
S3	170769	**IMPLANT**? OR **SUBCUTANEOUS**? OR **SUBDERMAL**? OR **EPIM**?SIUM OR EP-IM?SIA? OR **INTRAMUSCULAR**? OR **INTRAFASCICUL**? OR **INTERFASCICUL**?
S4	88399	**ELECTRODES** OR TRANSMITTERS
S5	359295	**MUSCLE**? OR **MUSCULAR**? OR **FLEXOR** OR **EXTENSOR** OR **PRONATOR** OR -**SUPINATOR**
S6	31682	**PROSTHES**?S OR **PROSTHET**IC?
S7	291307	**ARTIFICIAL**
S8	6925616	**ARM** OR **ARMS** OR **HAND** OR **HANDS** OR **LEG** OR **LEGS** OR **FOOT** OR **FEET** OR **LIMB** OR **LIMBS** OR **EXTREMITY** OR **EXTREMIT**IES
S9	7965	S6(3N)S8 OR S7(1W)S8
S10	81	S1(S)S9
S11	541	S4(5N)S5
S12	1533	S4(5N)S3
S13	**1**	**S10(S)S12**
S14	7	S1 AND S9 AND S12
S15	6	S14 NOT S13
S16	**4**	**RD (unique items)**
S17	27	S9(S)S12
S18	25	S17 NOT S13:S14
S19	20	RD (unique items)
S20	16	S19/2000:2004
S21	**4**	**S19 NOT S20**

13/7,K/1 (Item 1 from file: 160)
DIALOG(R)File 160:Gale Group PROMT(R)

00370189

The Boston Arm, an electric artificial limb, will reach commercial markets in 6-8 mo, according to Liberty Mutual Research Center spokesmen.

Tech Times March, 1977 p. 1,21

It will represent the first mass-produced commercial **prosthes**is. The **myoelectric** (**muscle** electric) operates by amplifying electronic signals from remnant **muscles** in the amputee's upper **arm** or shoulder and sending the signals through a control circuit to move the **arm**. The amputee controls the electronic impulses by natural **muscle** contraction. Weighing 2.5 lbs, the **arm** is a lightweight, compact power transfer system. In contrast, conventional **prosthetic** **arms** operate with cables or wires attached to the wearer's body. The amputee must learn to pull and twist his body in unnatural ways to move the **arm**, says Dr R Mann, professor of Biomedical Engineering at MIT. Mann applied his knowledge of small air-to-air missle

power systems in redesigning the **arm** four times in 14 years. Liberty Mutual funded much of the **arm**'s research since 1962 and will distribute it after completing tests of the nickel cadmium batteries. Another method for strengthening electrical signals, currently under study by Dr C DeLuca at Liberty Mutual, consists of **implanting electrodes** directly into the nerves rather than around **muscle** points. Still another idea for faster response would be to regulate each **arm**'s deadband, a fixed signal below which the **arm** won't move, according to individual **muscle** activity. The advantage would be more delicate control at lower **muscle** activity.

16/3,AB,K/1 (Item 1 from file: 149)
DIALOG(R)File 149:TGG Health&Wellness DB(SM)

01057173 SUPPLIER NUMBER: 02600085 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Using prosthetics to aid independence. (roundtable discussion) (Outlook 1983-physiatry - part 3)
Demarest, Colleen B.
Patient Care, v17, p45(13)
Jan 15, 1983
PUBLICATION FORMAT: Magazine/Journal ISSN: 0031-305X LANGUAGE: English
RECORD TYPE: Fulltext TARGET AUDIENCE: Professional
WORD COUNT: 2903 LINE COUNT: 00283

Lehneis From that research, we were able to develop an upper **extremity prostheses** --the **myoelectric prosthesis** --that contains **electrodes** located where the patient can contract his intact **muscles** to operate the...
...amputee only has so many **muscles** that he can use. If it were possible to **implant electrodes** , discrete **muscle** control, such as finger movement, might be effected. But this is difficult to achieve with surface **electrodes**.

Goodgold Would you comment on how the **myoelectric hand**, as opposed to a conventional device like a hook, might affect the patient's...
...If the patient is a plumber or electrician, for example, a device such as the **myoelectric arm** or **hand** will not help him when he returns to work; the device contains...
...needed. A patient who has a desk job might prefer the cosmetic advantage of the **myoelectric prosthesis** , since the **hand** portion does look like a **hand**. Also, any amputee today who does not want to...work with biofeedback [see "Putting biofeedback into perspective," page 37].

PC There are reports of **implantable electrodes** being used to produce motion in patients incapable of movement.

Grynbaum Some work has been...
...First, unless the patient has sensory feedback, he will not know the location of the **prosthetic limb** , so the sophisticated movements will be of no help. And second, a patient will only...
...agree?

Lehneis Absolutely. I've observed that a patient can do many things with a **myoelectric** or any other type **prosthe**sis. He will demonstrate what he can do with it, but...
...useful to the patient and what we consider is normal. In the case of the **myoelectric hand**, the pinching movement it provides is the essential action needed to have a **hand**. We can dream that perhaps special, small, **implantable electrodes** controlled by computers will give us a **hand** that can approximate the joint function capacity...The fitter marks a plumb line on the plastic socket to indicate positioning of the **prosthetic foot** ,

usually about 7-8 cm from the center of the heel of the opposite **foot**...
...DESCRIPTORS: **Artificial limbs** --

21/3,K/1 (Item 1 from file: 149)
DIALOG(R)File 149:TGG Health&Wellness DB(SM)

01099733 SUPPLIER NUMBER: 04288930 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Chips on the old block; microelectronic chips serve as newfangled tools for eavesdroppping on brain chatter.
Miller, Julie Ann
Science News, v129, p408(2)
June 28, 1986
PUBLICATION FORMAT: Magazine/Journal ISSN: 0036-8423 LANGUAGE: English
RECORD TYPE: Fulltext TARGET AUDIENCE: Academic; Consumer
WORD COUNT: 1370 LINE COUNT: 00134
... chip in the brain to communicate with brain cells in a semi-intelligent manner."
Such **electrodes** permanently **implanted** in the brain might be able to receive and generate electrical signals to bypass damaged...
...appropriate nerve cells or **muscles**. Pine also suggests that neurochips may be used to control **artificial limbs** .
But the work is only in early stages. "It's an art; there's no...

21/3,K/4 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

03127332
Brain powers into brave new world
ABIX - AUSTRALASIAN BUSINESS INTELLIGENCE (WEST AUSTRALIAN) , p1
October 16, 1998
JOURNAL CODE: WTWA LANGUAGE: English RECORD TYPE: ABSTRACT
WORD COUNT: 104
...in Atlanta hope the technology will eventually allow people who are completely paralysed to operate **artificial limbs** . The researchers developing the system for eight years tested it on monkeys before getting permission...

File 71:ELSEVIER BIOBASE 1994-2004/Nov W4
File 315:ChemEng & Biotec Abs 1970-2004/Nov
File 357:Derwent Biotech Res. _1982-2004/Dec W2
File 358:Current BioTech Abs 1983-2004/Nov
File 285:BioBusiness(R) 1985-1998/Aug W1
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13

Set	Items	Description
S1	5960	**ELECTROMYOGRA?** OR **MYOELECTRIC**? OR **EMG**
S2	17754	**ELECTRODES** OR TRANSMITTERS
S3	68345	**IMPLANT**? OR **SUBCUTANEOUS**? OR **SUBDERMAL**? OR **EPIM**?SIUM OR EP-IM?SIA? OR **INTRAMUSCULAR**? OR **INTRAFASCICUL**? OR **INTERFASCICUL**?
S4	41163	**ARTIFICIAL**
S5	11023	**PROSTHES**?S OR **PROSTHET**IC?
S6	185833	**ARM** OR **ARMS** OR **HAND** OR **HANDS** OR **LEG** OR **LEGS** OR **FOOT** OR **FEET** OR **LIMB** OR **LIMBS** OR **EXTREMITY** OR **EXTREMITI**ES
S7	116952	**MUSCLE**? OR **MUSCULAR**? OR **FLEXOR** OR **EXTENSOR** OR **PRONATOR** OR -**SUPINATOR**
S8	350	S4(1W)S6 OR S5(3N)S6
S9	1308	S2(5N)S3
S10	0	S1 AND S8 AND S9
S11	**1**	**S8 AND S9 [too recent]**
S12	7136	DS
S13	0	S1 AND S2 AND S3 AND S8
S14	2	S2 AND S3 AND S8
S15	**1**	**S14 NOT S11**
S16	47	S1 AND S6 AND S2 AND S3
S17	39	S7 AND S16
S18	39	RD (unique items)
S19	19	S18/2000:2004
S20	20	S18 NOT S19
S21	47	S16 NOT (S11 OR S14)
S22	**20**	**Sort S20/ALL/PY,A**

15/7/1 (Item 1 from file: 285)
DIALOG(R)File 285:BioBusiness(R)

00053548
MEET THE CAMPUS CAPITALISTS OF BIONIC VALLEY: THE UNIVERSITY OF UTAH NURTURES STARTUPS MAKING ARTIFICIAL HEARTS, ARMS , AND EARS.
Atchison S D
Business Week No.2945, p.114-115, 1986
ABSTRACT: Utah can be considered the state of biomedical engineering, largely due to Willem J. Kolff, retired director of the University of Utah's Institute for Biomedical Engineering and Division of **Artificial** Organs. Among biomedical companies set up through Kolff's aid is Motion Control, Inc., makers of **the Utah Arm, the first to be activated by electrodes directly connected to the amputee's muscle remnants**. Another company, Symbion Inc., was formed by Kolff and Robert K. Jarvick maker of the famous **artificial** hearts. Symbion is currently working on partial **artificial** hearts and has marketed a cochlear **implant** , which restores hearing in profoundly deaf people. These companies are providing jobs at a time when Utah's agriculture and mining demands are declining. Also, they are bringing tremendous amount of revenue to the state and more notably to the University which has accumulated $2 million in stock ventures.

22/6/1 (Item 1 from file: 71)
00077285 94051763
Neural and biomechanical specializations of human thumb muscles revealed by matching weights and grasping objects
PUBLICATION DATE: 19930000

22/6/2 (Item 2 from file: 71)
00156933 94167921
Coordination between head and hindlimb motions during the cat scratch response
PUBLICATION DATE: 19940000

22/6/4 (Item 4 from file: 71)
00325410 95149825
Motor effects of stimulating the human cerebellar thalamus
PUBLICATION DATE: 19950000

22/6/5 (Item 5 from file: 71)
00322906 95149444
Task-related variation in corticospinal output evoked by transcranial magnetic stimulation in the macaque monkey
PUBLICATION DATE: 19950000

22/6/6 (Item 6 from file: 71)
00277664 95099090
Midbrain suppression of limb withdrawal and tail flick reflexes in the rat: Correlates with descending inhibition of sacral spinal neurons
PUBLICATION DATE: 19950000

22/6/8 (Item 8 from file: 71)
00490751 96184721
A measure of peripheral nerve stimulation efficacy applicable to H-reflex studies
PUBLICATION DATE: 19960000

22/6/9 (Item 9 from file: 71)
00470270 96164225
Hopping and swimming in the leopard frog, Rana pipiens: II. A comparison of muscle activities
PUBLICATION DATE: 19960000

22/6/10 (Item 10 from file: 71)
00445060 96138950
Appropriately placed surface EMG electrodes reflect deep muscle activity (psoas, quadratus lumborum, abdominal wall) in the lumbar spine
PUBLICATION DATE: 19960000

22/6/11 (Item 11 from file: 71)
00416722 96110515
The relationship of vibrissal motor cortex unit activity to whisking in the awake rat
PUBLICATION DATE: 19960000

22/6/13 (Item 13 from file: 71)
00678525 97185292

Direct and indirect corticospinal control of arm and hand motoneurons in the squirrel monkey (Saimiri sciureus)
PUBLICATION DATE: 19970000

22/6/15 (Item 15 from file: 71)
01111087 1999074897
Use and fibre type composition in limb muscles of cats

22/6/17 (Item 17 from file: 71)
00810008 1998046463
Magnetic transcranial stimulation at intensities below active motor threshold activates intracortical inhibitory circuits
PUBLICATION DATE: 19980000

22/6/18 (Item 18 from file: 71)
01340414 2000007658
Asymmetry of hindlimb muscle 1activity and cutaneous reflexes after tendon **transfers in kittens**

22/6/19 (Item 19 from file: 71)
01252849 1999229779
Neurophysiological effects of stimulation through electrodes in the human subthalamic nucleus

22/6/20 (Item 20 from file: 71)
01082743 1999067259
Direct demonstration of interhemispheric inhibition of the human motor cortex produced by transcranial magnetic stimulation

22/7/3 (Item 3 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE

00154363 94152356
Limited independent flexion of the thumb and fingers in human subjects
Kilbreath S.L.; Gandevia S.C.
ADDRESS: S.L. Kilbreath, School of Physiotherapy, Faculty of Health Sciences, The University of Sydney, Sydney, NSW 2036, Australia
Journal: Journal of Physiology, 479/3 (487-497), 1994, United Kingdom
PUBLICATION DATE: 19940000
CODEN: JPHYA
ISSN: 0022-3751
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
We investigated whether human subjects can activate selectively **flexor** pollicis longus (FPL) and digital portions of **flexor** digitorum profundus (FDP). These **muscles** were selected because they are the only **flexors** of the distal phalanges. **Electromyographic** activity (**EMG**) was recorded with **intramuscular electrodes** from one digital component of the deep **flexors** ('test') while subjects lifted weights by flexing the distal interphalangeal joint of the other digits in turn ('lifting' digits). Only recording sites at which single motor units were recruited selectively at low forces were used. The weights lifted represented 2.5-50% of the maximal voluntary contraction (MVC). We measured the lowest weight lifted which produced phasic and tonic coactivation in the 'test' **muscle** . The extent of coactivation varied with the 'distance' between the test and lifting

digits although no significant difference occurred in the pattern of coactivation thresholds among the digital **flexors**. The extent of coactivation increased when angular displacement or velocity at the distal interphalangeal joint of the lifting digit increased but was not critically dependent on restraint of the **hand** . Because mechanical 'connections' could interfere with the ability to move a distal phalanx independently, the **arms** of nine cadavers were studied. The separation of tendons between the thumb (FPL) and the index portion of FDP, and between the index and middle portions of FDP, usually extended more proximally in the fore**arm** than separation between the tendons to the middle and ring fingers and between the ring and little fingers. Direct intertendinous links were also noted. It is not possible to direct a sufficiently focal motor command to flex selectively the distal joint of the fingers and thumb when forces exceeding 2.5% MVC are generated. For the middle, ring and little fingers in particular, movement of adjacent digits may also involve 'in-series' mechanical links between adjacent components of FDP.

22/7/7 (Item 7 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE

00258946 95058052
Differences and similarities in electrical muscle activity for the abductor pollicis longus muscle divisions
Van Oudenaarde E.; Elvers J.W.H.; Gielen C.C.A.M.; Kauer J.M.G.; Oostendorp R.A.B.; Van der Straaten J.H.M.
ADDRESS: E. Van Oudenaarde, Weezenhof 62-37, 6536 AP Nijmegen, Netherlands
Journal: Journal of Electromyography and Kinesiology, 5/1 (57-64), 1995, United Kingdom
PUBLICATION DATE: 19950000
CODEN: JEKIE
ISSN: 1050-6411
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
The abductor pollicis longus (APL) has to be viewed as an important **muscle** for moving and stabilizing the human thumb. This **muscle** has two divisions, a distal superficial division and a more proximal deep one. The **electromyographic** (**EMG**) signals from these divisions were measured for several motor tasks in order to investigate differences in activation and function. **EMG** signals were recorded with **intramuscular** wire **electrodes** in isometric as well as in dynamic contractions in different directions, both for the thumb and for the **hand** . The **EMG** signals of the right **hand** of eight subjects were scaled relative to the mean **EMG** value at the maximum voluntary isometric contraction (MVC) in order to compare relative **muscle** activity in various directions for different subjects. In 18 out of the 22 directions the **EMG** activity in the two divisions of the APL was modulated differently, indicating a different activation. The differences were most prominent in dorsal and palmar flexion of the **hand** . The results suggested that the APLdeep is activated to stabilize the carpal joint. The APLdeep is a direct mover of the carpal joint in dorsal flexion of the **hand**.

22/7/12 (Item 12 from file: 71)
DIALOG(R)File 71:ELSEVIER BIOBASE

00754958 97261587
The influence of forearm, hand and thumb positions on extensor carpi

ulnaris and abductor pollicis longus activity

Van Oudenaarde E.; Brandsma J.W.; Oostendorp R.A.B.
ADDRESS: E. Van Oudenaarde, Weezenhof 62-37, NL-6536 AP Nijmegen, Netherlands

Journal: Acta Anatomica, 158/4 (296-302), 1997, Switzerland
PUBLICATION DATE: 19970000
CODEN: ACATA
ISSN: 0001-5180
DOCUMENT TYPE: Article
LANGUAGES: English SUMMARY LANGUAGES: English
NO. OF REFERENCES: 12

The objective of this study was to investigate the influence of fore**arm**, **hand** and thumb positions on **electromyography** (**EMG**) activity of the abductor pollicis longus (APL) and the **extensor** carpi ulnaris (ECU) **muscles** . A second objective was to study the role of these **muscles** in stabilizing the wrist during movements of the thumb. This knowledge is important in clinical assessment and reconstructive surgery. At a constant force of 5 N for the thumb and 20 N for the **hand** , **EMG** activity was recorded with **intramuscular** wire **electrodes** in isometric and dynamic contractions in different positions and movements in the thumb and the **hand** . **EMG** activity of the right **hand** of 7 subjects was sealed relative to the mean **EMG** value at maximum voluntary isometric contraction to compare relative **muscle** activity in the tests. The results show that the position of the fore**arm** does influence activity of the APL, but not of the ECU. The deep part of the APL shows differences in **EMG** activity between the positions of the fore**arm** in dorsal flexion of the **hand** and the superficial part of the APL in palmar flexion of the **hand** . The ECU and the deep part of the APL are very active during movements and isometric contractions of the thumb. It is suggested that these **muscles** are necessary to stabilize the wrist during movements of the thumb to prevent undesired movements of the **hand** and the fore**arm**.

```
File 155:MEDLINE(R) 1951-2004/Nov W4
 S1        3400   'ARTIFICIAL LIMBS' OR DC='E7.695.50.' OR DC='E7.858.442.50-
              .' OR R4:R13
S2         687   'MYOELECTRIC COMPLEX, MIGRATING' OR DC='G10.261.482.570.' -
             OR DC='G11.561.450.100.570.' OR DC='G7.453.697.100.570.' OR '-
             MIGRATING MOTOR COMPLEX'
S3           0   S1 AND S2
S4       54009   MYOELECTRIC? OR ELECTROMYOGRA?
S5         232   S1 AND S4
S6       56231   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S7       49250   ELECTRODES OR TRANSMITTERS
S8      293513   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S9      148044   ARTIFICIAL
S10     135327   PROSTHES?S OR PROSTHETIC?
S11     456294   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S12     531091   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S13        236   S1 AND S6
S14          9   S7 AND S8 AND S13
```

14/6/5
04856986 PMID: 616276
Exponential growth and future of artificial organs.
Aug 1977

14/7/4
DIALOG(R)File 155:MEDLINE(R)

08682456 PMID: 2219554
[Improvement of prostheses and orthotic aids for the handicapped using electric stimulation and the registration of bioelectric signals]
Amelioration des protheses et aides orthotiques pour les **hand**icapes au moyen de stimulation electrique et d'enregistrement des signaux bioelectriques
Stein R B; Capaday C
Departement de physiologie, faculte de medecine, Universite d'Alberta.
L'union medicale du Canada (CANADA) May-Jun 1990, 119 (3) p102-8, ISSN 0041-6959 Journal Code: 0030444
Document type: Journal Article ; English Abstract
Languages: FRENCH
Main Citation Owner: NLM
Record type: Completed
Electro-mechanical devices can help a variety of patients with motor disabilities. Surface **EMG** from remaining **muscle**s in an amputated **arm** can be used to control powered electronic **hands**, wrists and elbows. Sensory signals such as knee angle and ankle torque can be used to control the visco-elastic properties of a knee joint for above-knee amputees. Finally, **percutaneous electrodes** can be used to stimulate paralyzed **muscle**s to replace **hand** function in quadriplegics and **leg** function in paraplegics. This article summarizes recent progress in each of these areas.
Record Date Created: 19901113
Record Date Completed: 19901113

14/7/6

DIALOG(R)File 155:MEDLINE(R)

04310619 PMID: 985948
[Development of powered prosthetic hands]
Kato I; Tanaka S
Iyo denshi to seitai kogaku. Japanese journal of medical electronics and biological engineering (JAPAN) Feb 1976, 14 (1) p1-8, ISSN 0021-3292
Journal Code: 17720370R
Document type: Journal Article
Languages: JAPANESE
Main Citation Owner: NLM
Record type: Completed
Record Date Created: 19761002
Record Date Completed: 19761002

14/7/7
DIALOG(R)File 155:MEDLINE(R)

03758885 PMID: 4786757
[Technical facilities for arm and hand function]
Tekniska hjalpmedel for **arm**- och **hand**funktion.
Lakartidningen (SWEDEN) Aug 1 1973, 70 (31) p2731-9, ISSN 0023-7205
Journal Code: 0027707
Document type: Journal Article
Languages: SWEDISH
Main Citation Owner: NLM
Record type: Completed
Record Date Created: 19740605
Record Date Completed: 19740605

14/7/8
DIALOG(R)File 155:MEDLINE(R)

02595152 PMID: 5706883
Implantation of micro-circuits for myo-electric control of prostheses.
Herberts P; Kadefors R; Kaiser E; Petersen I
Journal of bone and joint surgery. British volume (ENGLAND) Nov 1968, 50 (4) p780-91, ISSN 0301-620X Journal Code: 0375355
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Record Date Created: 19690318
Record Date Completed: 19690318

14/7/9
DIALOG(R)File 155:MEDLINE(R)

02595151 PMID: 5706882
Development of a surgically implanted myo-telemetry control system.
Tucker F R; Scott R N
Journal of bone and joint surgery. British volume (ENGLAND) Nov 1968, 50 (4) p771-9, ISSN 0301-620X Journal Code: 0375355
Document type: Journal Article
Languages: ENGLISH

```
Main Citation Owner: NLM
Record type: Completed
Record Date Created: 19690318
Record Date Completed: 19690318
```

```
File 149:TGG Health&Wellness DB(SM) 1976-2004/Nov W1
File  16:Gale Group PROMT(R) 1990-2004/Dec 07
File 148:Gale Group Trade & Industry DB 1976-2004/Dec 06
File  98:General Sci Abs/Full-Text 1984-2004/Sep
File 370:Science 1996-1999/Jul W3
File  20:Dialog Global Reporter 1997-2004/Dec 07
File  35:Dissertation Abs Online 1861-2004/Nov
Set     Items   Description
S1        138   TRANSDUCER?(S)(ELECTROMYOGRA? OR MYOELECTRIC? OR EMG)
S2      10935   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S3      72001   ELECTRODES OR TRANSMITTERS
S4     147738   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S5     258917   ARTIFICIAL
S6      26108   PROSTHES?S OR PROSTHETIC?
S7    6258954   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S8     341647   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S9         11   S1(S)S4
S10      7393   S5(1W)S7 OR S6(3N)S7
S11         0   S9 AND S10
S12         1   S9/2000:2004
S13        10   S9 NOT S12
S14        10   RD (unique items)[not relevant]

File 155:MEDLINE(R) 1951-2004/Nov W4
File   5:Biosis Previews(R) 1969-2004/Nov W3
File  73:EMBASE 1974-2004/Nov W4
File  34:SciSearch(R) Cited Ref Sci 1990-2004/Nov W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File 144:Pascal 1973-2004/Nov W4
File   2:INSPEC 1969-2004/Nov W4
File   6:NTIS 1964-2004/Nov W4
File   8:Ei Compendex(R) 1970-2004/Nov W4
File  35:Dissertation Abs Online 1861-2004/Nov
File  94:JICST-EPlus 1985-2004/Oct W5
File  95:TEME-Technology & Management 1989-2004/Jun W1
File  99:Wilson Appl. Sci & Tech Abs 1983-2004/Oct
File  71:ELSEVIER BIOBASE 1994-2004/Nov W4
File 285:BioBusiness(R) 1985-1998/Aug W1
Set     Items   Description
S1       1673   TRANSDUCER? ? AND (ELECTROMYOGRA? OR MYOELECTRIC)
S2     207825   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S3     572726   ELECTRODES OR TRANSMITTERS
S4    1504910   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S5    1042647   ARTIFICIAL
S6     415261   PROSTHES?S OR PROSTHETIC?
S7    2541763   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S8    2910516   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S9       1904   TRANSDUCER? AND S2
S10     19383   S5(1W)S7 OR S6(3N)S7
```

```
S11          0    S4(S)S9(S)S10
S12          1    S4 AND S9 AND S10
```

12/7/1   (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08040804   PMID: 3506808
  Sensory control of a multifunction **hand** **prosthe**sis .
  Kyberd P J; Chappell P H; Nightingale J M
  Department of Electrical Engineering, University of Southampton, UK.
  Biosensors (ENGLAND) 3 (6) p347-57, ISSN 0265-928X Journal Code: 8601088
  Document type: Journal Article
  Languages: ENGLISH
  Main Citation Owner: NLM
  Record type: Completed
  The current generation of **prosthe**ses that are fitted to **limb** deficient individuals have only a single degree of freedom which limits their functional range. Furthermore, electrically powered **prosthe**ses have a limited user input. Electrical signals generated by the contraction of **muscles** in the user's stump open and close the **hand** in an 'on and off' fashion. Since the only feedback is visual, the **prosthe**ses tend to be used less dexterously than body powered devices. A different approach has been adopted by the Control Engineering Group at Southampton University. They have retained a single **electromyogra**phic input channel, but added sensory feedback to an electronic controller, which decides on the grip posture and tension. Satisfactory operation of the **hand** depends on the sensors employed. A review of **transducers** used on previous **prosthe**ses at Southampton is followed by a description of recent sensor developments. Finally the intentions for a new generation of **prosthe**ses are outlined. These include combining sensory input with an integrated circuit microcontroller to provide a more reliable system.
  Record Date Created: 19890405
  Record Date Completed: 19890405

```
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200478
File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)
Set     Items    Description
S1        855    ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2     412491    ELECTRODES OR TRANSMITTERS
S3     168185    IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4      82265    ARTIFICIAL
S5      20408    PROSTHES?S OR PROSTHETIC?
S6    1054047    ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7      41927    MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S8        336    IC=(A61F-002/72 OR A61F-004?)
S9     252748    IC=A61B?
S10      2609    S4(1W)S6 OR S5(3N)S6
S11      5989    S2(S)S3
S12         1    S1 AND S10 AND S11 [a duplicate]
S13         6    S10 AND S11
S14         5    S13 NOT S12
S15         3    S8 AND S11
S16         0    S15 NOT S12:S13
S17       137    S11 AND S7
S18         8    S11 AND S1
S19         7    S18 NOT S12:S13
S20         1    S1 AND S2 AND S3 AND S10
S21         0    S20 NOT (S12:S13 OR S18)
```

14/34/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

015419937 **Image available**

WPI Acc No: 2003-482077/200345

Real time closed loop brain-machine interface for restoring voluntary motor control and sensory feedback to a subject, includes electrodes, signal processing mechanism, and actuator

Patent Assignee: UNIV DUKE (UYDU-N); CHAPIN J K (CHAP-I); NICOLELIS M A L (NICO-I); WESSBERG J (WESS-I)

Inventor: CHAPIN J K; NICOLELIS M A; WESSBERG J; NICOLELIS M A L

Number of Countries: 102 Number of Patents: 004

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200337231	A1	20030508	WO 2002US31269	A	20021001	200345	B
US 20030093129	A1	20030515	US 200112012	A	20011029	200345	
EP 1448121	A1	20040825	EP 2002782089	A	20021001	200456	
			WO 2002US31269	A	20021001		
AU 2002348482	A1	20030512	AU 2002348482	A	20021001	200464	

Priority Applications (No Type Date): US 200112012 A 20011029

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200337231	A1	E	110	A61F-004/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN

YU ZA ZM ZW
Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW
US 20030093129 A1 A61N-001/08
EP 1448121 A1 E A61F-004/00 Based on patent WO 200337231
Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
AU 2002348482 A1 A61F-004/00 Based on patent WO 200337231

Abstract (Basic): WO 200337231 A1

NOVELTY - A real time closed loop brain-machine interface comprises **electrodes** to acquire extra-cellular electrical signals from a population of single neurons, a signal processing mechanism to form extracted motor commands from the electrical signals, and an actuator to respond to the extracted motor commands and to provide sensory feedback to the subject

DETAILED DESCRIPTION - A real time closed loop brain-machine interface comprises **electrodes** to be chronically **implanted** in the nervous system of a subject (5) and to acquire extra-cellular electrical signals from a population of single neurons, a signal processing mechanism to communicate with the **electrodes** and to form extracted motor commands from the electrical signals, and an actuator to communicate with the processing mechanism and to respond to the extracted motor commands by effecting a movement and to provide sensory feedback to the subject.

An INDEPENDENT CLAIM is also included for:

(a) a method of controlling an actuator and imparting voluntary motor control and sensory feedback to a subject by neural signals, comprising ; extracting a motor command from processed neural signals, transmitting the extracted command to an actuator, acquiring and interpreting sensory feedback information, and relaying the interpreted information back to the subject.

USE - For restoring voluntary motor control and sensory feedback to a subject who has lost a degree of voluntary motor control and sensory feedback.

ADVANTAGE - The invention can translate neural signals in the brain of a subject into movement of an external device, and can operate continuously or discontinuously at the subject's discretion.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic drawing of a brain-machine interface.

Subject (5)

Cable (85)

pp; 110 DwgNo 1A/4

Technology Focus:

TECHNOLOGY FOCUS - METALLURGY - Preferred Material: The **electrodes** comprise microwires made from stainless steel, platinum, or tungsten.

POLYMERS - Preferred Material: The microwires are TEFLON coated.

INSTRUMENTATION AND TESTING - Preferred Component: The microwires are oriented in a definite spatial relationship relative to one another to form a microwire array comprising 16-128 microwires or a microwave bindle. The signal processing mechanism comprises neurochip(s) to be chronically **implant**ed in the body of a subject, a data acquisition module in communication with the neurochips, a motor command extraction module, and a power supply. The neurochips are sealed with an insulating material to prevent contact with blood or tissue. The actuator comprises a **prosthetic limb** . The communication between the

neurochips and data acquisition module is through a cable (85).
Preferred Property: The microwires have a diameter of 50, preferably 25-50 microm. The difference in length between a first wire tip and a second wire tip is 150-300 microm.
INORGANIC CHEMISTRY - Preferred Material: The insulating material is aluminum trioxide. The power supply comprises a lithium battery
Derwent Class: A85; P32; S05; T01; T06
International Patent Class (Main): A61F-004/00; A61N-001/08
International Patent Class (Additional): A61N-001/10; A61N-001/18; A61N-001/20; A61N-001/32; A61N-001/34; A61N-001/40

14/34/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013773122 **Image available**
WPI Acc No: 2001-257333/200126
Electric stimulation system for limb stump of amputee, has electrical signal generator which provides electrical signals to electrodes implanted in limb stump to provide electrical stimulation to nerve
Patent Assignee: NEUROSTREAM TECHNOLOGIES INC (NEUR-N)
Inventor: HOFFER J A
Number of Countries: 095 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200102054	A2	20010111	WO 2000CA789	A	20000705	200126	B
AU 200056692	A	20010122	AU 200056692	A	20000705	200130	
EP 1196217	A2	20020417	EP 2000941857	A	20000705	200233	
			WO 2000CA789	A	20000705		
JP 2003503166	W	20030128	WO 2000CA789	A	20000705	200309	
			JP 2001507542	A	20000705		

Priority Applications (No Type Date): US 99142983 P 19990706
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200102054	A2	E	29	A61N-001/34	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
AU 200056692	A			A61N-001/34	Based on patent WO 200102054
EP 1196217	A2	E		A61N-001/34	Based on patent WO 200102054

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2003503166	W		32	A61F-002/02	Based on patent WO 200102054

Abstract (Basic): WO 200102054 A2
NOVELTY - **Electrodes** (14) are **implanted** in the **limb** stump (10) of an amputee such that the **electrodes** are placed in a close proximity to a severed sensory nerve (20) in the **limb** stump to provide an electrical stimulation to the nerve upon receiving the supplied current. An electrical signal generator (12) provides and varies the electrical signals to each electrode.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
(a) an amputee's phantom **limb** pain alleviating method;

(b) a sensory feedback providing system;
(c) and a sensory feedback providing method.

USE - For treatment of phantom **limb** pain of amputee having **limb** stump.

ADVANTAGE - Enables alleviating phantom **limb** pain of amputee and replacing lost sensory function from missing **limb**. Suppresses central perception of pain information in small-diameter fibers when there is an absence of activity that normally occur in large-diameter sensory fibers, hence attaining pain sensation to reach consciousness. Enables restoring normal balance of activity in large and small diameter fibers which counterbalance the excessive flow of paint information in central pathways. Ensures effective treatment of phantom **limb** pain of amputee.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic view of amputee's **limb** stump and a **prosthetic** **limb** having electric stimulation system.

Limb stump (10)
Electrical signal generator (12)
Electrodes (14)
Sensory nerve (20)
pp; 29 DwgNo 1/3

Derwent Class: P32; P34; S05
International Patent Class (Main): A61F-002/02; A61N-001/34

19/26,TI/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

016271550
WPI Acc No: 2004-429444/200440
Treatment of patient with neoplastic disease involves delivering electrical stimulation in the form of direct electric current and/or periodic waveform

19/34/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

016384129
WPI Acc No: 2004-542036/200452
Method for implanting electromyographic **electrodes into striated muscles under experimental conditions**
Patent Assignee: TVER MED AKAD (TVER-R)
Inventor: ELISEEV A V; KROMIN A A; STRAKHOV M A
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
RU 2231308	C1	20040627	RU 2003100978	A	20030113	200452	B

Priority Applications (No Type Date): RU 2003100978 A 20030113
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
RU 2231308	C1			A61B-017/00	

Abstract (Basic): RU 2231308 C1

NOVELTY - Method involves immobilizing an animal after a period of fastening, fixing it with its cheek upward, shorn and shaved cheek is treated with 5% iodine solution in ethyl alcohol and layer-by-layer cutting tissues in the cheek area near the upper one-third of chewer **muscle** close to anterior edge under local transverse section anesthesia with 2% Novocain solution. Fascia is cut with 7 mm long incision in

parallel to **muscle** fibers, separating the **muscle** fibers bluntly to build **muscle** pocket of 4mm x 4mm dimensions to which electrode is brought. Then, atraumatic needle is introduced into the **muscle** 2-3 mm proximal relative to **muscle** pocket apex and to the right and left of the **muscle** pocket. The needle is brought out through the pocket into the incision in the **muscle**. Needle pierce out is carried out through the **muscle** pocket 2 mm far from pierce in place. Electrode substrate is pulled in into the **muscle** pocket. Three isolated sutures are tied on **muscle** surface. Wires are brought out by means of trocar to cranium surface scalped in advance. The wires are soldered to standard connection unit and sealed with fast-hardening plastic.

USE - Medicine.

ADVANTAGE - High reliability of obtained experimental results.

pp; 0 DwgNo 0/0

Derwent Class: P31; P85; S05
International Patent Class (Main): A61B-017/00
International Patent Class (Additional): G09B-023/28

```
File 348:EUROPEAN PATENTS 1978-2004/Nov W04
File 349:PCT FULLTEXT 1979-2002/UB=20041202,UT=20041125
Set     Items   Description
S1       1835   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2     134064   ELECTRODES OR TRANSMITTERS
S3     148239   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4      64481   ARTIFICIAL
S5      19917   PROSTHES?S OR PROSTHETIC?
S6     803664   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7      69725   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S8         81   IC=(A61F-002/72 OR A61F-004?)
S9      57101   IC=A61B?
S10      1165   S4(1W)S6 OR S5(3N)S6
S11      2620   S2(5N)S3
S12         4   S10(S)S11
S13        97   S11(5N)S7
S14         3   S10 AND S13
S15         3   S14 NOT S12 [2 duplicates; 1 not relevant]
S16        11   S10(S)S2(S)S3
S17         7   S16 NOT (S12 OR S14)
```

12/6/2 (Item 2 from file: 349)
00768797 **Image available**
ELECTRICAL STIMULATION SYSTEM FOR TREATING PHANTOM LIMB PAIN

12/3,K/3 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00545635 **Image available**
SYSTEM AND METHODS FOR CONTROLLING DEVICES BY BRAIN SIGNALS
SYSTEMES ET PROCEDES DE COMMANDE DE DISPOSITIFS PAR DES SIGNAUX PROVENANT DU CERVEAU
Patent Applicant/Assignee:
  EMORY UNIVERSITY,
Inventor(s):
  HUMPHREY Donald R,
Patent and Priority Information (Country, Number, Date):
  Patent: WO 200009008 A1 20000224 (WO 0009008)
  Application: WO 99US18172 19990811 (PCT/WO US9918172)
  Priority Application: US 98135249 19980817
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
  AU CA JP AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
Publication Language: English
Fulltext Word Count: 12524
Fulltext Availability: Detailed Description
Detailed Description
... device according to a preferred embodiment of the present invention. Here the control of an **artificial limb**, or of stimulation of paralyzed **muscles** of the **limb**, to produce a particular motion is...

...is assumed in this 23
description that two prior conditions have been met. First, the **electrodes** have been **implanted** in brain regions that have been shown with functional imaging procedures to be under the...

17/6/3 (Item 2 from file: 349)
00969382 **Image available**
PROCESS TO CREATE ARTIFICIAL NERVES FOR BIOMECHANICAL SYSTEMS USING OPTICAL WAVEGUIDE NETWORK

17/3,AB,K/2 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

01095915
CONTROL SYSTEM AND METHOD FOR CONTROLLING AN ACTUATED PROSTHESIS
SYSTEME DE COMMANDE ET PROCEDE POUR COMMANDER UNE PROTHESE ACTIONNEE
Patent Applicant/Assignee:
VICTHOM HUMAN BIONICS INC, 4780, rue Saint-Felix, Bureau 105, Saint-Augustin-de-Desmaures, Quebec G3A 2J9, CA, CA (Residence), CA (Nationality)
Inventor(s):
BEDARD Stephane, 256, rue du Tonnelier, Saint-Augustin-de-Desmaures, Quebec G3A 2K5, CA,
Legal Representative:
MCCARTHY TETRAULT LLP (agent), Pellemans, Nicolas, Le Windsor, 1170 Peel Street, Montreal, Quebec H3B 4S8, CA,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200417873 A1 20040304 (WO 0417873)
Application: WO 2003CA937 20030620 (PCT/WO CA03000937)
Priority Application: US 2002405281 20020822; US 2002424261 20021106; US 2003453556 20030311
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 17106
English Abstract
The method and the control system are used for determining a portion of locomotion and a phase of locomotion portion in view of controlling an actuated **prosthes**is in real time. Accordingly, the method comprises receiving a data signal from a plurality of main **artificial** proprioceptors (16), obtaining a first and a second derivative signal for each data signal, obtaining a third derivative signal for at least one of the data signals, using a set of a first state machines to select one state among a plurality of possible states for each **artificial**

proprioceptor with the corresponding data and derivative signals, generating the phase of locomotion portion using the states of the main **artificial** proprioceptors; and using a second state machine to select the portion of locomotion among a plurality of possible portions of locomotion using events associated to the data signals. It is particularly well adapted for the control of an actuated **leg prosthes**is (12) **for above-knee amputees.**

Fulltext Availability: Detailed Description

Detailed Description

... the **prosthes**is knee joint. The plantar pressure sensors are used under both **feet**, including the **artificial foot** . It could also be used under two **artificial feet** if required. One of the gyroscope is located at the shank of the normal **leg**...

...**artificial** proprioceptors (16) are neuro-sensors which measure the action potential of motor nerves, **myoelectric**al **electrodes** which measure the internal or the external **myoelectric**al activity of **muscle**s, needle matrix **implants** which measure the cerebral activity of specific region of the cerebrum cortex such as motor...

17/3,AB,K/5 (Item 4 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

00458276

ARTIFICIAL SENSIBILITY

SENSIBILITE ARTIFICIELLE

Patent Applicant/Assignee:
  HAND MEDIC HB,
  LUNDBORG Goran,
Inventor(s):
  LUNDBORG Goran,
Patent and Priority Information (Country, Number, Date):
  Patent: WO 9848740 A1 19981105
  Application: WO 98SE786 19980429 (PCT/WO SE9800786)
  Priority Application: SE 971595 19970429
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
  AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Fulltext Word Count: 2332

English Abstract

Loss or absence of sensibility in the **hand**, **foot** or other part of the body can constitute a severe **hand**icap after injury or in disease. Also when **hand prosthes**es are used following amputation, injuries lack of sensibility in the **prosthes**es constitutes a major problem. The prevailing invention refers to a new principle for **artificial** sensibility by sense substitution (replacement of a lost sense function by utilization of an alternate sense). The primary aim is to, by using the hearing sense, achieve sensibility in **hand prosthes**es or **hand**s which have lost their sensibility by injury or disease. According to this principle vibrotactile stimuli to the fingers are registrated by sensors of microphone type, placed at finger level, the signals being processed and

transformated into acoustic stimuli. By using this principle the patient can "feel with the hearing sense" hereby utilizing the hearing sense to register and identify the surface, texture, density and shape of the item which is touched.

Fulltext Availability: Detailed Description

Detailed Description

... sensibility would be of great importance. A review a number of such situations follows below:

Hand prostheses

Following amputation injuries at fore**arm** - or upper **arm** level the patient can have good use of an " **artificial hand** ", i.e. a **hand prosthesis** can replacing the amputated **hand** . Such a **hand prosthesis** can be fixed to the amputation stump ...part of the fore**arm** (amputation stump, or by titanium fixtures (according to Branemark) which are **implanted** into the skeleton. The **prosthe**sis can be of cosmetic nature without possibilities for movement, or...

...are controlled by electric activity **in muscles** which remain in the amputation stump. By surface **electrodes** in the sleeve, enclosing the amputation stump, such impulses in **extensor** or **flexor muscle**s can in the **prosthe**sis which can open or close the **prosthetic hand**

Myoelectric hand prostheses can be very useful, but many patients use their **prosthe**ses only to a limited extent...

```
File 350:Derwent WPIX 1963-2004/UD,UM &UP=200478
File 347:JAPIO Nov 1976-2004/Aug(Updated 041203)
Set    Items    Description
S1       855    ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2    412491    ELECTRODES OR TRANSMITTERS
S3    168185    IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4     82265    ARTIFICIAL
S5     20408    PROSTHES?S OR PROSTHETIC?
S6   1054047    ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7     41927    MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S8    111303    TRANSDUCER? ?
S9    104842    S8 NOT S2
S10       12    S1 AND S9
S11        1    S3 AND S10 [not relevant]
S12        1    S10 AND S6 [not relevant]
S13       10    S10 NOT S11:S12

 13/26,TI/10     (Item 10 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
002092936
WPI Acc No: 1979-B2825B/197906
  Linear  electromyographic  bio-feedback system - has third order
  averaging filter providing signal representative of instantaneous value
  of muscle activity, to control oscillator

13/7/9     (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004  Thomson Derwent. All rts. reserv.
009512169     **Image available**
WPI Acc No: 1993-205705/199325
Control system for myoelectric prosthesis for below-the-elbow amputees -
generates sensing signal associated with movement of body part and linearises
signal to be linear function of magnitude of distance moved by body part
Patent Assignee: NASA US NAT AERO & SPACE ADMIN (USAS  )
Inventor: BOZEMAN R J
Number of Countries: 001  Number of Patents: 004
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
US N7937325     N   19930601  US 92937325      A   19920831  199325  B
US 5376128      A   19941227  US 92937325      A   19920831  199506
US 5458655      A   19951017  US 92937325      A   19920831  199547
                              US 94283474      A   19940726
US 5480454      A   19960102  US 92937325      A   19920831  199607
                              US 94282843      A   19940726
Priority Applications (No Type Date): US 92937325 A 19920831; US 94283474 A
  19940726; US 94282843 A 19940726
Patent Details:
Patent No  Kind Lan Pg   Main IPC     Filing Notes
US N7937325   N      24 A61F-000/00
US 5376128    A      11 A61F-002/54
US 5458655    A      11 A61F-002/54   Div ex application US 92937325
```

```
                                           Div ex patent US 5376128
US 5480454     A      11 A61F-002/54    Div ex application US 92937325
                                           Div ex patent US 5376128
```

Abstract (Basic): US N7937325 N

The control system for **prosthe**tic devices includes a **transducer** for receiving movement from a body part for generating a sensing signal associated with the movement. The sensing signal is processed for linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearised sensing signal is normalised to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part.

The normalised signal is divided into a number of discrete command signals. The discrete command signals are used by typical converter devices which operate the **prosthe**tic device. The converter devices uses the discrete command signals for driving the moveable portions of the **prosthe**tic device and its sub-**prosthes**is.

USE/ADVANTAGE - Easy-to-use ''shrug'' techniques generate discrete finger digit control and wrist rotation, control system can be easily mounted in body of **prosthe**tic devices, conformal printed circuit-type conductors can be employed, improved maintenance, individual finger digital control is proposed instead of hook with cable actuation, wrist rotation capability, hardware programmable, use of frictional forces for actuation.

Dwg.4/5

US 7937325 N

The control system for **prosthe**tic devices includes a **transducer** for receiving movement from a body part for generating a sensing signal associated with the movement. The sensing signal is processed for linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearised sensing signal is normalised to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part.

The normalised signal is divided into a number of discrete command signals. The discrete command signals are used by typical converter devices which operate the **prosthe**tic device. The converter devices uses the discrete command signals for driving the moveable portions of the **prosthe**tic device and its sub-**prosthes**is.

USE/ADVANTAGE - Easy-to-use ''shrug'' techniques generate discrete finger digit control and wrist rotation, control system can be easily mounted in body of **prosthe**tic devices, conformal printed circuit-type conductors can be employed, improved maintenance, individual finger digital control is proposed instead of hook with cable actuation, wrist rotation capability, hardware programmable, use of frictional forces for actuation.

Dwg.4/5

US 7937325 A

The control system for **prosthe**tic devices includes a **transducer** for receiving movement from a body part for generating a sensing signal associated with the movement. The sensing signal is processed for linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part. The linearised sensing signal is normalised to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through

the full-shrug position of the moveable body part.

The normalised signal is divided into a number of discrete command signals. The discrete command signals are used by typical converter devices which operate the **prosthe**tic device. The converter devices uses the discrete command signals for driving the moveable portions of the **prosthe**tic device and its sub-**prosthe**sis.

USE/ADVANTAGE - Easy-to-use ''shrug'' techniques generate discrete finger digit control and wrist rotation, control system can be easily mounted in body of **prosthe**tic devices, conformal printed circuit-type conductors can be employed, improved maintenance, individual finger digital control is proposed instead of hook with cable actuation, wrist rotation capability, hardware programmable, use of frictional forces for actuation.

Dwg.4/5

Abstract (Equivalent): US 5480454 A

A control system for use with a **prosthe**tic device, the **prosthe**tic device comprising a plurality of moveable sub-**prosthe**ses and incorporating any implementation of harness and shoulder control hardware such that the shoulder shrug control movement associated with a moveable body part ranging from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part provides control by the user to the **prosthe**tic device, the control system comprising:

(a) a shoulder harness for engaging the body part and for receiving the movement from the body part,

(b) a linear potentiometer for mechanically receiving the movement from said shoulder harness and for generating a linear sensing signal in consonance with the movement of the body part,

(c) an attenuator potentiometer for receiving the linear sensing signal from said linear potentiometer and for scaling the linear sensing signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part,

(d) a bar graph driver circuit for receiving the scaled linear signal from said attenuator potentiometer and for dividing the scaled signal into a plurality of discrete command signals,

(e) current driver means operatively associated with said bar graph driver circuit for receiving the discrete command signals from said bar graph driver circuit and for generating electrical drive signals, corresponding to said command signals, and

(f) a solenoid/motor arrangement for receiving the drive signals from said current driver means and controlling each of said moveable sub-**prosthe**sis of the **prosthe**tic device by a different one of said drive signals.

Dwg.4/5

US 5458655 A

A method for controlling a **prosthe**tic device, the **prosthe**tic device comprising a plurality of moveable sub-**prosthe**ses and incorporating any implementation of harness and shoulder control hardware such that the shoulder shrug control movement associated with a moveable body part ranging from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part provides control by the user to the **prosthe**tic device, the method for controlling the **prosthe**tic device comprising the steps of:

(a) receiving the movement from the body part,

(b) generating a sensing signal in consonance with the movement of the body part,
(c) linearising the sensing signal to be a linear function of the magnitude of the distance moved by the body part,
(d) normalizing the linear signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part,
(e) dividing the normalized signal into a plurality of discrete command signals, and
(f) implementing the plurality of discrete command signals for driving a respective one of said plurality of moveable sub-**prosthe**ses of the **prosthe**tic device.

Dwg.4/5

US 5376128 A

The control comprises a **transducer** for generating at least one sensing signal in consonance with the movement of the body part. A lineariser is configured to receive the sensing signal from the **transducer** and to linearise the sensing signal to be a linear function of the magnitude of the distance moved by the body part. A normaliser is associated with the lineariser for receiving the linear signal from the lineariser and for normalising the linear signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part. A normaliser is associated with the lineariser for receiving the linear signal from the lineariser and for normalising the linear signal to be a function of the entire range of body part movement from the no-shrug position of the moveable body part through the full-shrug position of the moveable body part.

A discriminator is configured to receive the normalised signal from the normaliser for dividing the normalised signal into discrete command signals.

USE - For control of **prosthe**tic devices.

Dwg.3/5

Derwent Class: P32; S05; V06
International Patent Class (Main): A61F-000/00; A61F-002/54
International Patent Class (Additional): A61F-002/70

```
File 348:EUROPEAN PATENTS 1978-2004/Nov W04
File 349:PCT FULLTEXT 1979-2002/UB=20041202,UT=20041125
Set     Items   Description
S1       1835   ELECTROMYOGRA? OR MYOELECTRIC? OR EMG
S2     134064   ELECTRODES OR TRANSMITTERS
S3     148239   IMPLANT? OR SUBCUTANEOUS? OR SUBDERMAL? OR EPIM?SIUM OR EP-
             IM?SIA? OR INTRAMUSCULAR? OR INTRAFASCICUL? OR INTERFASCICUL?
S4      64481   ARTIFICIAL
S5      19917   PROSTHES?S OR PROSTHETIC?
S6     803664   ARM OR ARMS OR HAND OR HANDS OR LEG OR LEGS OR FOOT OR FEET
              OR LIMB OR LIMBS OR EXTREMITY OR EXTREMITIES
S7      69725   MUSCLE? OR MUSCULAR? OR FLEXOR OR EXTENSOR OR PRONATOR OR -
             SUPINATOR
S8      58827   TRANSDUCER? ?
S9      47959   S8 NOT S2
S10        28   S1(S)S9
S11         2   S3(S)S10 [not relevant]
S12         8   S6(S)S10
S13         5   S10(S)S4:S5
S14         2   S13 NOT S11:S12
S15        17   S10 NOT S11:S14
S16       513   S1(S)S2 NOT S10
S17       106   S16(S)S4:S6
S18        14   S3(S)S17

 12/6/5     (Item 4 from file: 349)
00439679    **Image available**
DIGITAL MOTOR EVENT RECORDING SYSTEM

14/3,AB,K/2     (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
(c) 2004 WIPO/Univentio. All rts. reserv.
00374506
METHOD FOR CONTROL OF PROSTHESES AND OTHER AID MEANS
PROCEDE PERMETTAN L'ACTIVATION D'UNE PROTHESE OU DE TOUT AUTRE APPAREIL
    D'ASSISTANCE
Patent Applicant/Assignee:
  CYPROMED A S,
  STAVDAHL oyvind,
  GRoNNINGSAETER Aage,
Inventor(s):
  STAVDAHL oyvind,
  GRoNNINGSAETER Aage,
Patent and Priority Information (Country, Number, Date):
  Patent:                 WO 9715249 A1 19970501
  Application:            WO 96NO246 19961022  (PCT/WO NO9600246)
  Priority Application: NO 954221 19951023
Designated States:
(Protection type is "patent" unless otherwise stated - for applications
prior to 2004)
  AL AM AT AU AZ BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU IL IS JP
  KE KG KP KR KZ LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD
  SE SG SI SK TJ TM TR TT UA UG US UZ VN KE LS MW SD SZ UG AM AZ BY KG KZ
  MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF
  CG CI CM GA GN ML MR NE SN TD TG
```

Publication Language: English
Fulltext Word Count: 3044
English Abstract
Described is a method for controlling **prosthe**ses and other assistive devices using tissue whose state is influenced by the central nervous system of a user. The state of the tissue is sensed, and information from this sensing is fed into a unit (9, 10) that estimates the motor intention of the user and controls the **prosthe**sis according to this estimate. The method comprises transmission of ultrasound signals into the tissue by use of an ultrasound **transducer** (6) and then reception of the ultrasound signals modulated by the tissue by use of an ultrasound **transducer** (7). Based on these received ultrasound signals, the motor intention of the user is estimated, and based on this mentioned estimate a number of **prosthe**sis states are controlled.
Fulltext Availability: Detailed Description
Detailed Description
... undesired variations in the signal amplitude, and thereby directly influence the 30 control of the **prosthe**sis . Furthermore, **myoelectric** and myoacoustic signals measured on the skin surface express a weighted sum of the activities of all **muscles** in the area where the detecting **transducer** is placed, but it is difficult to discern between the contributions of the individual **muscles**...

15/6/12 (Item 7 from file: 349)
00326482
APPARATUS AND METHOD FOR TIME DEPENDENT POWER SPECTRUM ANALYSIS OF PHYSIOLOGICAL SIGNALS

18/6/10 (Item 8 from file: 349)
00763392 **Image available**
METHOD AND APPARATUS FOR MONITORING TENDON MOTION

18/3,AB,K/9 (Item 7 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00780650
EMG CONTROL OF **PROSTHE**SIS
COMMANDE **EMG** DE PROTHESES
Patent Applicant/Inventor:
RISO Ronald R, Herluf Trolles Gade 28, 2.th., DK-9000 Aalborg, DK, DK (Residence), US (Nationality)
Legal Representative:
PATENTGRUPPEN APS (agent), Arosgarden, Aaboulevarden 23, DK-8000 Aarhus C , DK,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200113778 A2-A3 20010301 (WO 0113778)
Application: WO 2000DK464 20000821 (PCT/WO DK0000464)
Priority Application: DK 991149 19990820
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AT (utility model) AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ CZ (utility model) DE DE (utility model) DK DK (utility model) DM DZ EE EE (utility model) ES FI FI (utility model) GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO

NZ PL PT RO RU SD SE SG SI SK SK (utility model) SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 6325
English Abstract
A method and a system for controlling a **prosthes**is such as an **artificial limb**. **Electromyogra**phic (**EMG**) signals are used to generate control signals for one or more **prostheses** such as **artificial limb**s. The **electromyogra**phic (**EMG**) signals are received by one or more sets of **electrodes** dedicated to a source of **electromyogra**phic (**EMG**) signals. By using dedicated **electrodes**, **electromyogra**phic (**EMG**) signals originating from well-defined sources may be picked up. Consequently, **EMG** signals stemming from a **muscle** which would be activated by a human being when this human being would move a part of his body, e.g. a **limb** or a part of a **limb** replaced by a **prosthes**is, may be detected, picked up and used to control the corresponding **prosthes**is or corresponding part of the **prosthes**is.
Fulltext Availability: Detailed Description
Detailed Description
... a missing part of the body replaced by a **prosthes**is, e.g. **muscles** in an **arm** of a below elbow (BE) amputee. However, the sets of **electrodes** may be **implant**ed in any residual **limb** or other **muscle**s as desired in order to improve the **EMG** signal pattern discriminality. For example, a **muscle** in a shoulder part of an amputee may provide resourceful **EMG** signal information relating to the desired movements of for example a **hand** or an ann.
Preferably, as stated in claim 4, the electrornyographic (**EMG**) signals from said...cross talk from other sources of **EMG** signals.
The **muscles** in which the sets of **electrodes** are **implant**ed may for example be residual **muscles** related to a missing part of the body replaced by a **prosthes**is , e.g. **muscle**s in an **arm** of a below elbow (BE) amputee. However, the sets of **electrodes** may be **implant**ed in any residual **limb** or other **muscles** as desired in order to improve the **EMG** signal pattern discriminality. For example, a **muscle** in a shoulder part of an amputee may provide resourceful **EMG** signal infort-nation relating to the desired movements of for example a **hand** or an **arm** , whereby the functionality of the system may be enhanced.
As stated in claim 15, the...of a system according to the invention.
A human being 30 who has lost a **hand** has had a number of **EMG electrodes implant**ed in the fore**arm** 31. These are connected by means of wires 32 to a signal...

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200478

Set	Items	Description
S1	728	**ELECTROMYOGRA**? OR **MYOELECTRIC**? OR **EMG**
S2	246639	**ELECTRODES** OR **TRANSMITTERS**
S3	102183	**IMPLANT**? OR **SUBCUTANEOUS**? OR **SUBDERMAL**? OR **EPIM**?SIUM OR EP-IM?SIA? OR **INTRAMUSCULAR**? OR INTRA**FASCICUL**? OR INTER**FASCICUL**?
S4	54839	**ARTIFICIAL**
S5	19176	**PROSTHES**?S OR **PROSTHE**TIC?
S6	688552	**ARM** OR **ARMS** OR **HAND** OR **HANDS** OR **LEG** OR **LEGS** OR **FOOT** OR **FEET** OR **LIMB** OR **LIMBS** OR **EXTREMITY** OR **EXTREMIT**IES
S7	38196	**MUSCLE**? OR **MUSCULAR**? OR **FLEXOR** OR **EXTENSOR** OR **PRONATOR** OR - **SUPINATOR**
S8	96707	**TRANSDUCER**? ?
S9	44	S1 AND (S2 OR S9) AND S4:S6
S10	46	S1 AND (S2 OR S8) AND S4:S6
S11	**2**	**S3 AND S10 [1 duplicate; 1 not relevant]**
S12	31	S10 AND S7
S13	**29**	**S12 NOT S11**

13/26,TI/4
DIALOG(R)File 350:Derwent WPIX

013156954
WPI Acc No: 2000-328827/200028
Electromyographic apparatus for use in the diagnosis of **muscle** activity in the lower lumbar regions of humans, has **electrodes** and support having apertures and front and rear faces

13/26,TI/10
DIALOG(R)File 350:Derwent WPIX

010426080
WPI Acc No: 1995-327400/199542
Prosthetics electrode array diagnostic system - has array of **electrodes** for testing **muscle** , and converts amplified and filtered electric signals detected from contraction into digital signal for transmission to computer to display one or more signals

13/26,TI/13
DIALOG(R)File 350:Derwent WPIX

010010731
WPI Acc No: 1994-278443/199434
Prosthetics electrode array diagnostic system - using array of **electrodes** for testing **muscle** to produce electric signals from contraction which are amplified, filtered, and converted to digital signal for transmission to computer for display

13/26,TI/18
DIALOG(R)File 350:Derwent WPIX

008504757
WPI Acc No: 1991-008841/199102
Processing **electromyogra**phic signals obtained from body **muscles** - using microcomputer to acquire data on actual wrist position from

precision potentiometer for display

13/7,K/1
DIALOG(R)File 350:Derwent WPIX

015231150 **Image available**
WPI Acc No: 2003-292074/200329
Supple socket for upper **limb** **prosthe**sis has rigid reinforcing member between silicone-coated supporting layers
Patent Assignee: LA RENAISSANCE SANITAIRE FOND PRIVEE REC (RENA-N)
Inventor: DECHAMPS E
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
FR 2828093	A1	20030207	FR 200110522	A	20010806	200329	B

Priority Applications (No Type Date): FR 200110522 A 20010806
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
FR 2828093	A1		42	A61F-002/80	

Abstract (Basic): FR 2828093 A1
NOVELTY - A socket (110) for upper **limb** **prosthe**sis comprises a rigid reinforcing member (210) between two silicone-coated supporting layers, and a thin layer of foam padding. The reinforcing member, made from resin reinforced with glass or carbon fibres and molded on a 'positive' corresponding to the shape of the amputee's stump, is connected by an intermediate component to an **artificial** elbow or **hand** .

DETAILED DESCRIPTION - A socket (110) for upper **limb** **prosthe**sis consists of a rigid reinforcing member (210) between two silicone-coated supporting layers and includes a thin layer of foam padding. The reinforcing member, made from resin reinforced with glass or carbon fibres and molded on a 'positive' corresponding to the shape of the amputee's stump, is connected by an intermediate component to an **artificial** elbow or **hand** , while the supporting layers are of a silicone coated woven fabric. Where the **prosthe**sis uses **myoelectric** control, the reinforcing member has at least one generally rectangular or circular cut out for the connection of **electrodes** opposite the appropriate **muscles** .

An INDEPENDENT CLAIM is also included for a method of producing the socket.

USE - Socket for upper **limb** **prosthe**sis for uses such as to replace an amputated **hand** , fore**arm** or upper **arm** .

ADVANTAGE - The socket is designed for comfort, with a suppleness allowing it to adapt to variations in the shape of the stump.

DESCRIPTION OF DRAWING(S) - The drawing shows a perspective view of the socket.

Socket (110)
Reinforcing member (210)
pp; 42 DwgNo 1/48

Derwent Class: A32; A96; D22; P32
International Patent Class (Main): A61F-002/80

13/7,K/12
DIALOG(R)File 350:Derwent WPIX

010283709 **Image available**
WPI Acc No: 1995-184968/199524
Computerised electronic **hand prosthes**is - transmits feedback signals representing gripping force to wearer to allow positioning and gripping force control corresp to capabilities and requirements of individual wearer
Patent Assignee: MCP SERVICES INC (MCPS-N)
Inventor: HASLAM T P; TOMPKINS M E
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5413611	A	19950509	US 92915618	A	19920721	199524	B

Priority Applications (No Type Date): US 92915618 A 19920721
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5413611	A		17	A61F-002/72	

Abstract (Basic): US 5413611 A

The computerized electronic **hand prosthes**is uses input, feedback, control, and operating systems configurable to provide precise control and gripping forces corresponding to the particular capabilities and requirements of an individual wearer. An articulated **prosthes**is is capable of exerting a mechanical gripping force and contains a programmable microcomputer. **Electrodes** on the **prosthes**is contact **muscle**s of the remnant portion of a **limb** and produce an electric command signal responsive to the **myoelectric** signal created by the wearer contracting and relaxing the **muscles** in the remnant portion.

A drive motor in the **prosthes**is causes the **prosthes**is to exert a mechanical gripping force responsive and proportional to the electric command signal. Force sensors in the digits of the **prosthes**is detect the force exerted and produce an electric sensor signal responsive and proportional thereto. A motor driven vibratory device on the **prosthes**is engages the remnant portion of the **limb** adjacent sensory nerves and produces a feedback signal perceptible to the wearer which changes in vibratory pattern and amplitude at various selective grip forces.

USE/ADVANTAGE - Computerized electronic **prosthes**is with selectively configurable operating parameters corresp to particular capabilities and requirements of individual wearer.

Dwg.3/9

Derwent Class: P32; S05; T01; T06; V06
International Patent Class (Main): A61F-002/72
International Patent Class (Additional): A61F-002/54

13/7,K/29
DIALOG(R)File 350:Derwent WPIX

001274150
WPI Acc No: 1975-F8057W/197522
Bioelectrically controlled **prosthe**tic member - has reversible D.C. motor responsive to **muscular electromyogra**phic signals
Patent Assignee: LIBERTY MUTUAL INSU (LIBE-N)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 3883900	A	19750520				197522	B

Priority Applications (No Type Date): US 73395236 A 19730907
Abstract (Basic): US 3883900 A

The **prosthe**tic **arm** has a drive, housed within the elbow unit, includes a reversible direct current permanent magnet torque motor and a transmission including a planetary gear reduction unit, a reverse locking clutch, and a planocentric unit and the transmission is connected to the fore**arm** member with its output shaft part of the pivotal connection therewith. The fore**arm** member houses a battery pack and the circuitry by which the motor is operated in either direction in response to **electromyogra**phic signals that may be picked up from the biceps and triceps by **electrodes** when attached to the stump and processed to drive the motor in a direction and at a rate dependent on the dominant **EMG** signals.

Derwent Class: P32
International Patent Class (Additional): A61F-001/06